

Booz Allen Innovation Center, Washington DC

Data Science: What? Why? How? Who?

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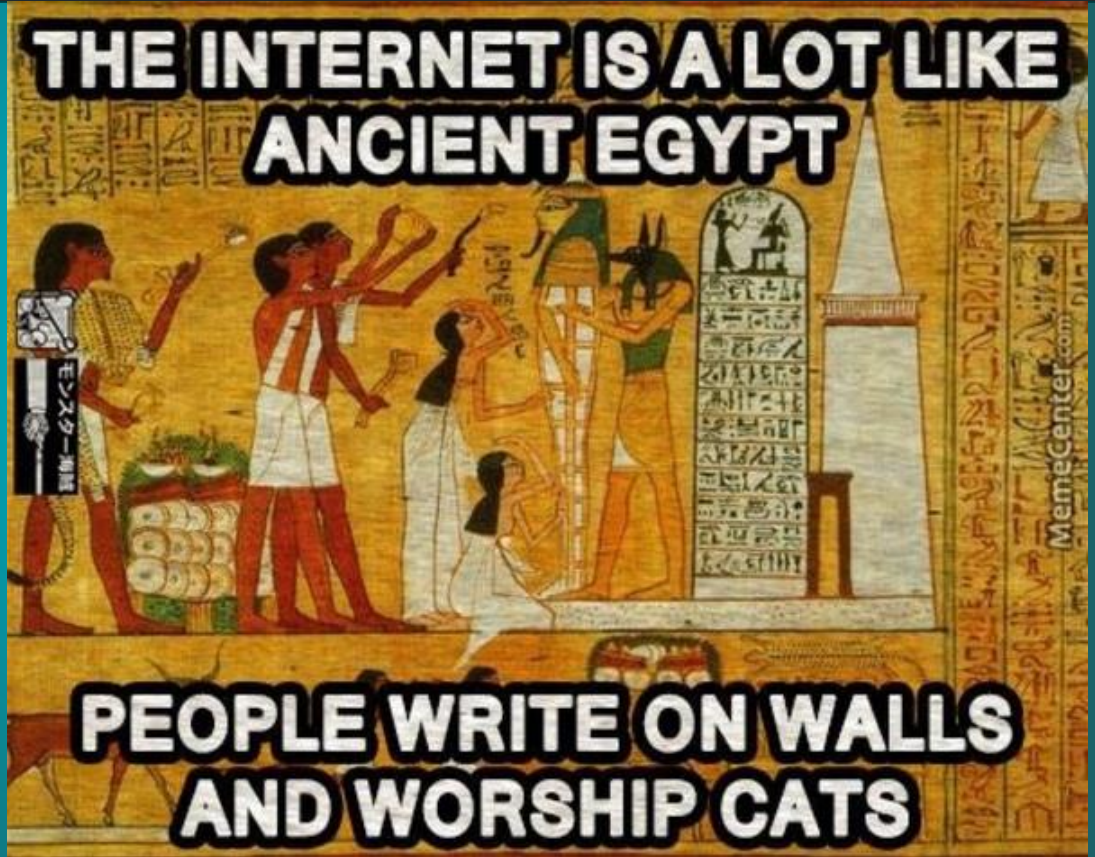
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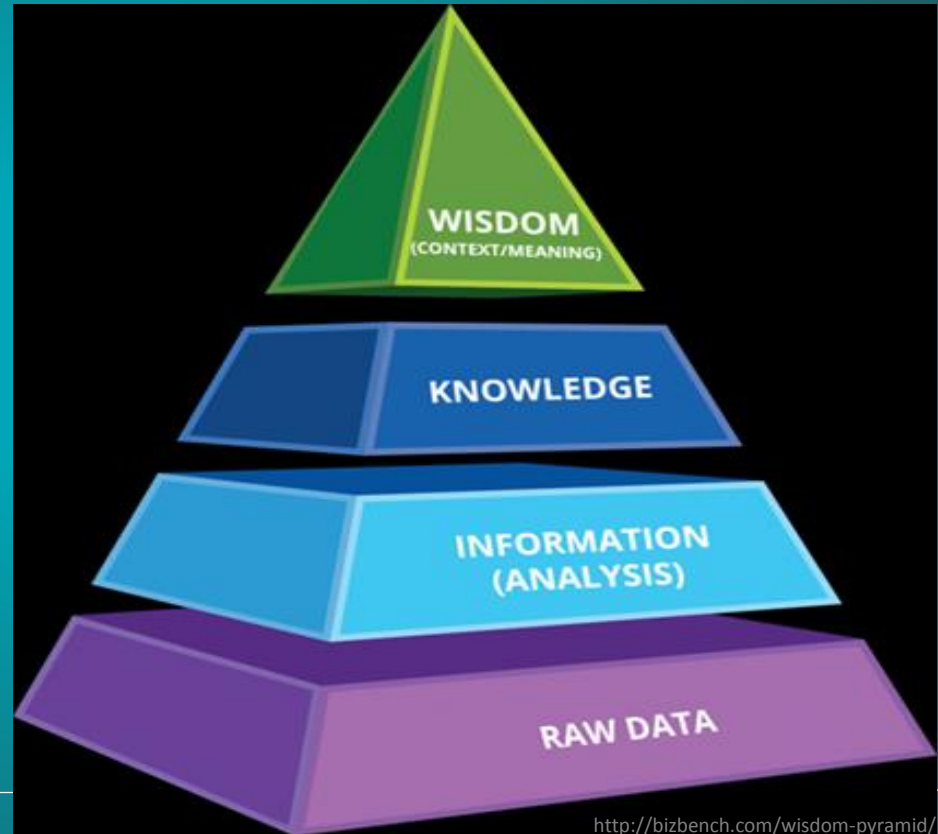
WE ARE ALL DATA GENERATORS! SHOULDN'T WE ALL BE VALUE GENERATORS?



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- **Data to Discovery**
- **Data to Decisions**
- **Data to Dollars**
(the 3 D2D's)

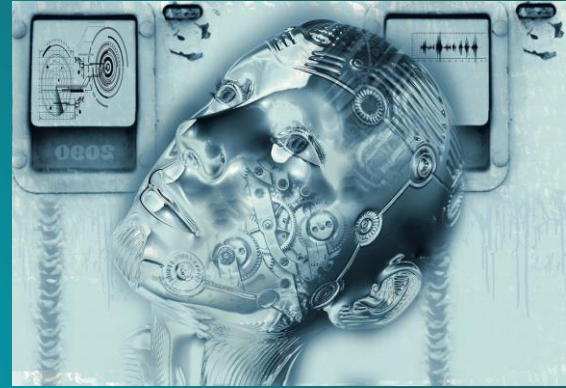
- **Data to Knowledge**
- **Data to Insights**
- **Data to Value**



“The two most important things in Data Science are the data and the science!”

Some Quick Definitions:

- **Machine Learning (ML)** = mathematical algorithms that learn from experience (= pattern recognition from previous evidence).
- **Data Mining** = application of ML algorithms to data.
- **Artificial Intelligence (AI)** = application of ML algorithms to robotics and machines = taking actions based on data (**#bots**).
- **Data Science** = application of scientific method to discovery from data (including inference, hypothesis generation, experimentation, validation, refinement) – using statistics, ML, & more: modeling, network analysis,...
- **Analytics** = the products of machine learning & data science.



TOP 5 i-REASONS TO ENGAGE IN DATA SCIENCE



- 1) INTEREST
- 2) INSIGHT
- 3) INSPIRATION
- 4) INNOVATION
- 5) IGNITION

TOP 5 i-REASONS TO ENGAGE IN DATA SCIENCE

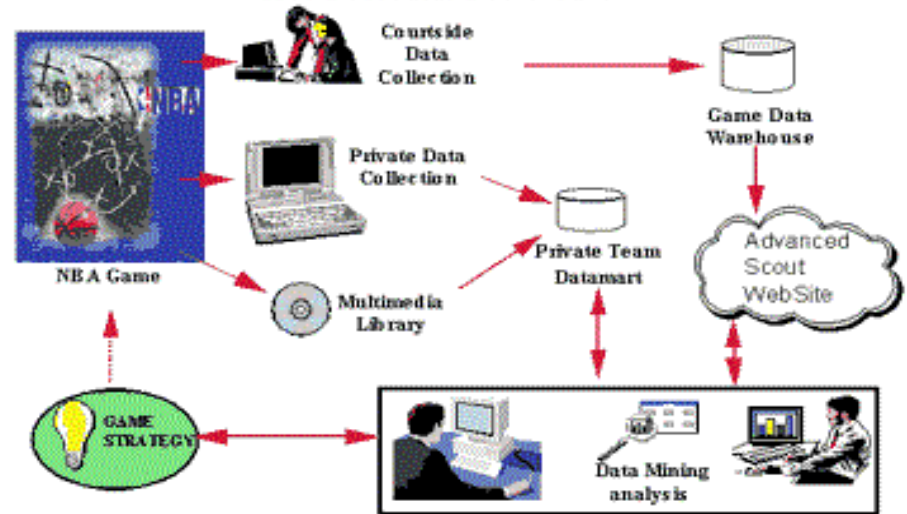
#1. INTEREST = attracts people with a passion, interests them with a challenge, and then offers them power and a purpose

1

Data Mining what?



IBM Advanced Scout for NBA Coaches Information Flow



<http://dssresources.com/cases/DSScatalog.html#ADSCOUT>

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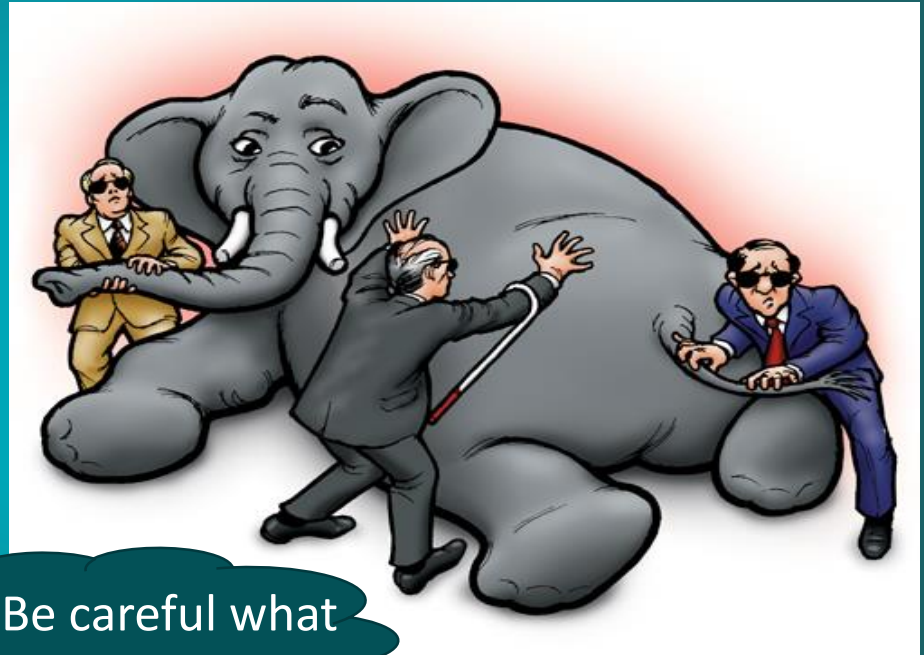
#2. INSIGHT = opening our eyes to deeper understandings

2

I wish we had more data...



...Be careful what you wish for!!!!



TOP 5 i-REASONS TO ENGAGE IN DATA SCIENCE

#3. INSPIRATION = inspiring diverse participants to tackle a challenging problem of deep importance and impact

3

Passion!
Curiosity!
Purpose!



- The Joy of Discovery
- Data Hackathons
- Social Challenge Problems
- Online Data Science Competitions



TOP 5 i-REASONS TO ENGAGE IN DATA SCIENCE

#4. INNOVATION = discovering new solutions and new questions

4

The art
of the
possible...



Innovation is
change that
unlocks new
value.

- Jamie Notter

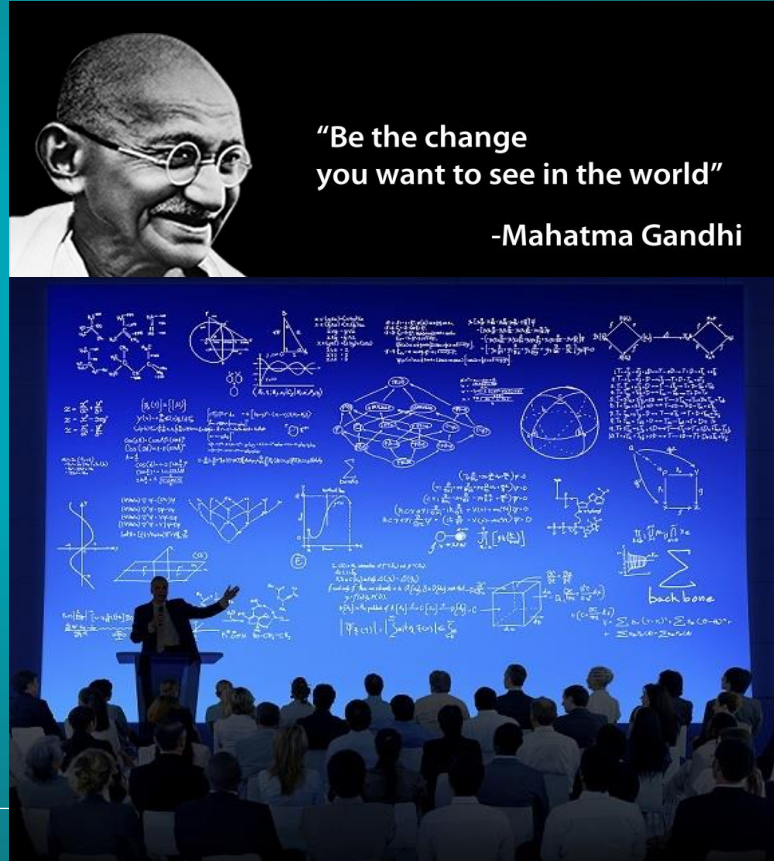
Remember
to invent the
Post-it Note

TOP 5 i-REASONS TO ENGAGE IN DATA SCIENCE

#5. IGNITION = igniting people, change, growth, transformation

5

Be the spark!



TOP 5 i-REASONS TO ENGAGE IN DATA SCIENCE



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Connected Everything in the IoT (Internet of Things)

Data Science = intelligence at the edge of the network (actionable insights at the point of data collection)

Context is King! – Welcome to The Internet of Context!

“You can see a lot just by looking.” – Yogi Berra

The Internet used to be a thing. Now, things are the Internet.



The XYZ of Data Science Innovation – Using Data for Broader Impacts

Smart X

X

- Smart Cities
- Smart Energy
- Smart Infrastructure

Precision Y

Y

- Precision Medicine
- Precision Farming
- Precision Pricing

Personalized Z

Z

- Personalized Health
- Personalized Learning
- Personalized Shopping Experience



<http://www.loopcayman.com/content/if-smart-cities-are-next-big-thing-what-about-smart-regions>

Big Data + IoT + Data Scientists = Partners in Sustainability

The Internet of Things (IoT):

Knowing the knowable via deep, wide, and fast data from ubiquitous sensors!



<http://www.unglobalpulse.org>

Big Data:

In the Big Data era, Everything is Quantified and Tracked :

- Populations & Persons
- Power Grids, Smart Energy Systems
- Smart Cities, Farms, Highways
- Environmental Sensors
- IoE = Internet of Everything!

Discovery through AI, Machine Learning, and Data Science:

- Class Discovery
- Correlation Discovery
- Novelty Discovery
- Association Discovery

*The 17 SDGs are KPIs for the World!
(currently, the SDGs have 229
Key Performance Indicators)
(SDG: Sustainability Development Goal)*

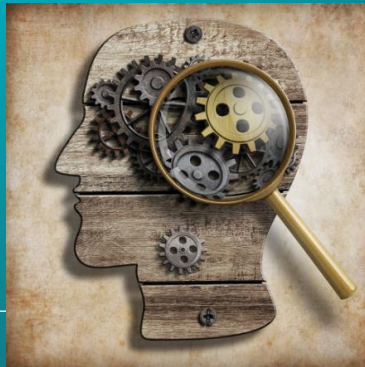
DATA SCIENTISTS SAIL THE “7 SEAS” OF DATA SCIENCE: Focus on Aptitudes and Attitudes. Skills can be trained.

The “Seven” Seas (C’s):

- 1) Cognitively Curious (ask questions ... the right questions!)
- 2) Creative (design thinker)
- 3) Courageous problem-solver (rocks the culture, willingness to fail)
- 4) Cool under pressure (tolerance for ambiguity)
- 5) Continuous life-long learner (hackathons, online classes, ...)
- 6) Communicator (data storyteller; able to “talk the walk”)
- 7) Collaborative (“data science is a team sport”)

+ 5 more:

- 8) Critical Thinker
- 9) Computational
- 10) Consultative
- 11) Community-focused
- 12) Compassion (Empathy)

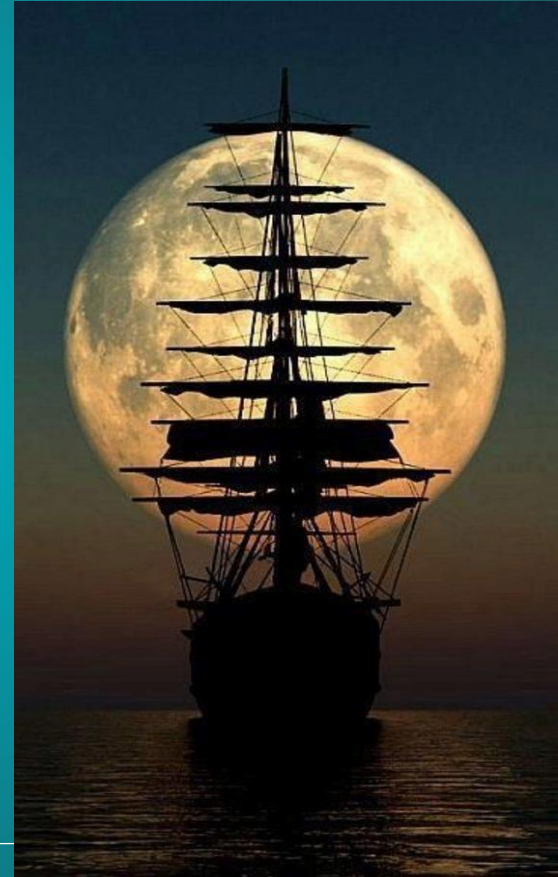


DATA SCIENTISTS ARE EXPLORERS -- -- EXPLORING VAST AND ENDLESS SEAS OF DATA!

*“If you want to build a ship,
don’t drum up people to
gather wood and don’t
assign them tasks and work,
but rather teach them to
yearn for the vast and
endless sea.”*

- Antoine de Saint-Exupery

<http://www.nytimes.com/2008/04/11/world/europe/11exupery.html>



<https://www.pinterest.com/pin/377106168772298092/>